



# Environmental Stocktake

Te Kaunihera ā-Rohe o Manawatū  
Arotakenga Taiao

October 2021

[www.mdc.govt.nz](http://www.mdc.govt.nz)



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# 1. Purpose and scope of this document

## Te take me te korahi o tēnei tuhinga

This environmental stocktake provides a snapshot of the Manawatū environment and describes an overview of the pressures that have shaped it – both historically and today. It also sets out the legislative responsibilities for Council as stewards of the natural environment.

The report is intended to provide context for the Manawatū District Council’s Environmental Strategy and Action Plan. The Environmental Strategy and Action Plan was a commitment made by Council in July 2019, in its Statement on Climate Change. It is envisaged that this Strategy and Action Plan will set clear strategic direction for the way in which Manawatū District Council will address environmental issues affecting the District, including climate change.

In light of the purpose of the report, its focus is on the state of the natural environment in the District and the pressures on it, including climate change. It is not a description of the built environment, or the work that Council does in that sphere (e.g., planning, social housing), except where it impacts, either positively or negatively, on the natural environment or climate. In terms of council responsibilities (Section 2) and council actions (Section 5) detailed in the report, the focus is on district council responsibilities in respect of environmental stewardship and actions that have led, both in terms of intent and outcomes, to reductions in council’s environmental impacts.

Finally, this is primarily intended as a state of the environment report for the District. It does not offer projections in respect of, for example, the extent and scope of economic impacts or potential economic opportunities that may arise as a consequence of climate change. If this is of interest to Council, it is recommended that this analysis be commissioned separately from appropriately qualified experts.

## 2. Setting the scene: the regulatory, national and global context

Te whakatakinga: te horopaki ā-ture, ā-motu, huriao hoki

### Our statutory responsibilities

Territorial Authorities have a range of responsibilities as stewards of the environment under a range of legislation, including the following:

- The Local Government Act 2002 requires local authorities to 'maintain and enhance the quality of the environment', and to allow for 'the reasonably foreseeable needs of future generations' (section 14(h)(ii) and (iii)). These needs are framed in terms of the four wellbeings: social, economic, environmental and cultural (sections 3(d) and 10(1)(b)).
- The Resource Management Act 1991, under which local authorities are responsible for the management of effects on land, whether it be through development or other activities, and also as it relates to the maintenance of indigenous biological diversity (section 31(b)).<sup>1</sup>
- The Climate Change Response (Zero Carbon) Amendment Act 2019, under which local authorities have a legal responsibility to provide information on how their organisation manages the risk of climate change, including risk assessment, measurement and mitigation.
- Under the Zero Carbon Act, the Climate Change Commission is responsible for producing carbon emissions reduction budgets, which will enable New Zealand to transition to a low emissions economy (and achieve carbon neutrality by 2050 as required by the Act). The Government will adopt these first set of budgets by December 2021. (See more details on the Climate Change Commission's initial advice to government below.)

It is also likely that, over time, legislative responsibilities for addressing or adapting to climate change will increase.

As a territorial authority undertaking responsibilities for the environment, there is recognition that these responsibilities must be undertaken in partnership with mana whenua, the iwi and hapū that have mana over the whenua and awa of the Manawatū.

### Climate Change Commission recommendations with focus on local government

In June 2021, the Climate Change Commission provided its final advice to government. In its report it calls for progressively greater emissions reductions. It calls for a 15 percent reduction in long-lived greenhouse gases by 2025, and up to a 63 percent reduction by 2035. It calls for biogenic methane emissions (from agriculture) to be reduced by 17 percent by 2035.

All its recommendations will impact on local government and the communities that councils represent. However, to follow are the recommendations relating to the sectors of most direct relevance to local government and its functions.

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1. Resource management legislation is currently undergoing reform. The current proposal is that the Resource Management Act will be replaced by three new acts: The Natural and Built Environments Act, the Strategic Planning Act and the Climate Change Adaptation Act. For more information on each proposed piece of legislation see <https://www.mfe.govt.nz/rma/resource-management-system-reform>

## Transport

The Climate Change Commission recommends:

- That the government sets a time limit on light vehicles with internal combustion engines entering New Zealand. The time limit should be no later than 2035.
- That the government provides local government with greater support to reduce communities' reliance on cars, including through legislation, by removing regulatory barriers and providing increased and targeted funding. For example, the report suggests changing the cost recovery model for public transport (which currently requires 50% of costs to be recovered through fares) to allow public transport fares to be reduced.
- That the government works with local authorities to set targets and implement plans to substantially increase walking, cycling, public transport and shared transport by the end of 2022. It specifically recommends central government should substantially increase its share of funding dedicated to active and public transport infrastructure.

## Waste

The Climate Change Commission recommends:

- Increased ambitions around cutting waste, with a target of decreasing biogenic waste methane emissions by at least 40 percent. Specifically, recommends greater investment in waste reduction, and acting in collaboration with local government, community groups and industry to leverage cross-sector action and finance.
- Setting a date by which high performance gas capture systems are mandated for all landfills that accept organic waste.

## Urban form/development

The Climate Change Commission recommends:

- That new developments are planned in a way that is compatible with a low emissions future.
- That the reform of the resource management system enables low emissions transport, land use, infrastructure and building systems.
- That existing public spaces and infrastructure are retrofitted to prioritise the use of active and public transport and other low emissions choices.
- Developing a consistent approach to quantifying the emissions impacts of urban development decisions, and better factoring in of emissions into decision-making on land use, transport and infrastructure investments.

## Buildings

The Climate Change Commission recommends that:

- All new buildings are constructed to be low emissions, healthier and climate resilient and existing buildings are progressively upgraded. Minimum Building Code requirements such as energy efficiency standards should be progressively increased.

## Agriculture

The Climate Change Commission:

- Notes that stock numbers may need to be reduced if no new technology becomes available to drive efficiencies. It emphasises that this may not necessarily mean a reduction in productivity.
- Recommends setting a farm emissions pricing scheme, or bringing agriculture into the emissions trading scheme.
- Recommends ongoing investment in research and development, particularly of technologies and practices to reduce biogenic emissions from agriculture.

The Government has until 31 December 2021 to set the first three emissions budgets out to 2035, and to release New Zealand's first emissions reduction plan detailing policies that will be used to achieve the budgets.

## The global and national context

Globally, humanity's recognition of environmental issues, and the part that humans have played in creating them, has never been greater. We have come to understand the cumulative impact that our industrialised, consumption-oriented society has had on our land, fresh water, oceans and atmosphere. Our impacts on the global environment include the destruction of indigenous ecosystems – especially forests and wetlands – on a scale never seen before. Our ability to produce consumer products quickly and cheaply has led to a consumption-driven culture, resulting in unprecedented levels of waste, including plastics, which biodegrade only very slowly – over hundreds if not thousands of years. Much of this plastic has ended up in our oceans, and scientists now predict that the ocean will contain more plastic than fish by 2050 unless globally we take significant action to reduce the generation of plastics.<sup>2</sup>

Our consumption of fossil fuels and increasingly intensive land-use activities has led to climate change – the increasing of atmospheric and ocean temperatures at a rate many times that of any increases seen historically.

As a small, sparsely populated country at the bottom the South Pacific, New Zealand is better placed environmentally than many regions of the world. Overall, for example, we have relatively good air quality, and being isolated we are generally not affected by activity in other countries (a recent exception being the Australian bush fires of 2019–20). But in other spheres of our environment – land, biodiversity, fresh water and marine – we are grappling with significant pressures. Our relative geographic isolation will also be no protection from the effects of climate change, as is already becoming evident.

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2. Ministry for the Environment, 2020. 'Reducing the impact of plastic on our environment: moving away from hard-to-recycle and single-use items' (consultation document), accessed from <https://www.mfe.govt.nz/reducing-impact-of-plastic-on-environment>



We have deteriorating freshwater quality in most regions, particularly in lowland pastoral and urban areas. We have geologically young and relatively thin soils, which are both relatively infertile but also highly susceptible to erosion when subject to deforestation or land disturbance, which affects both our rivers and streams but also our estuarine systems, as sediment flows out to sea. We have lost much of our indigenous flora and fauna since humans settled the New Zealand archipelago, and biodiversity continues to experience a decline – primarily due to introduced pests, but also habitat destruction, especially in lowland environments. Our ocean’s fish stocks are in decline as a result of overfishing and destructive practices such as bottom trawling. Finally, New Zealand is experiencing the effects of climate change – for instance, our glaciers have lost 25 percent of their ice in the past 40 years.<sup>3</sup> These and other impacts are shown in Figure 1.

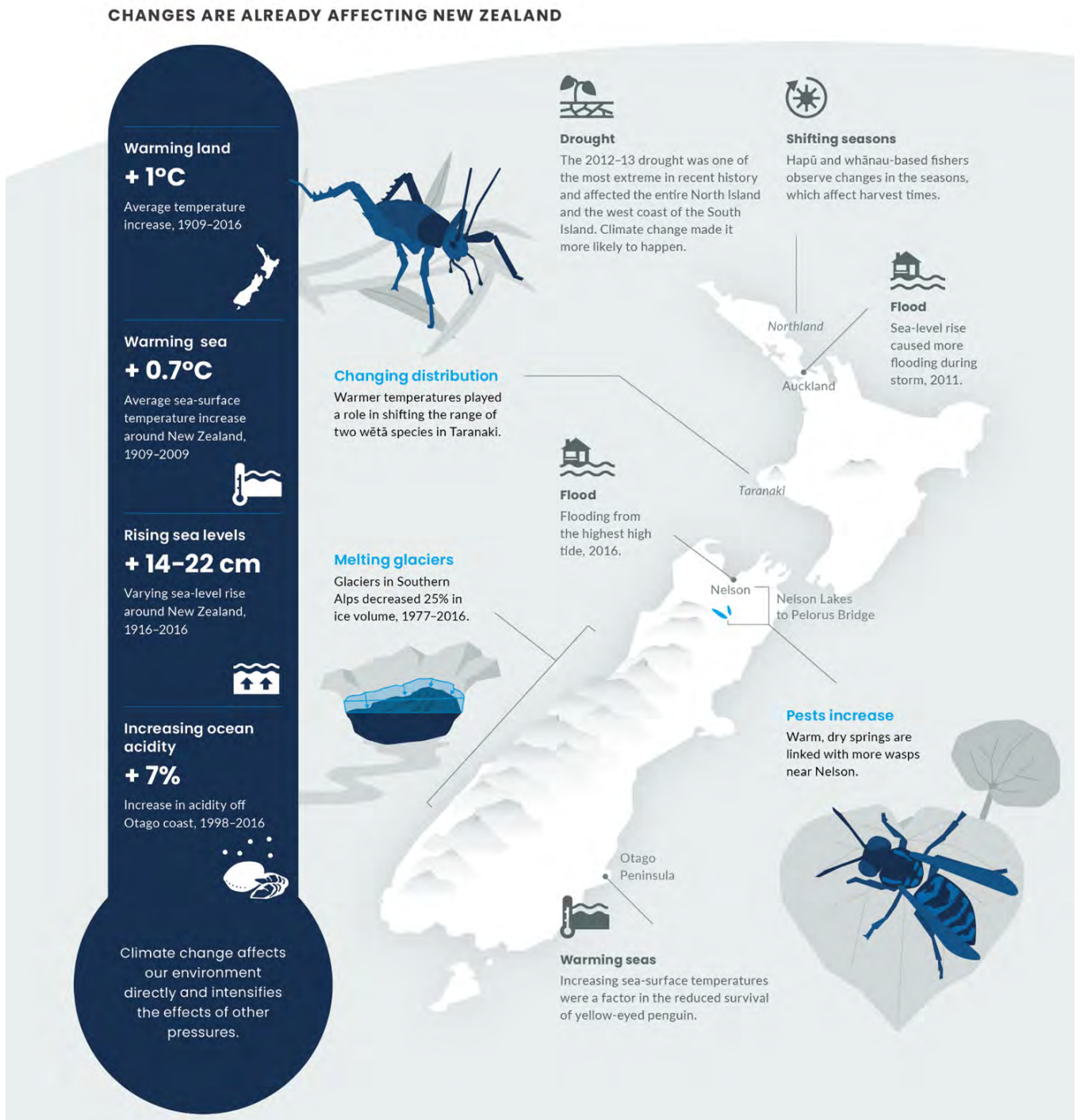


Figure 1: Impacts of climate change (Ministry for the Environment, 2019)

3. Ministry for the Environment, 2019. 'Environment Aotearoa 2019 summary', accessed from <https://www.mfe.govt.nz/Environment-Aotearoa-2019-Summary#issue-9>

# 3. Manawatū District – the state of our environment

## Te rohe o Manawatū – te āhua o te taiao

In the Manawatū District, we share many of the pressures on the environment as other regions throughout New Zealand – the primary difference is in scale and relative magnitude. In some cases, for example, freshwater extraction, the pressures in the District are more limited than those experienced in other regions, while in others, e.g., soil erosion, the problem is significant.

This section will cover the state of land and biodiversity, freshwater, and climate change, the pressures at play in each of these spheres, as well as other indicators such as waste generation, in the District.

### Land and biodiversity

As can be seen from Figure 2 below, in the coastal and lowland areas of the District, there is little of our indigenous ecosystems remaining. This is primarily the result of historical deforestation, which followed European settlement of the district from the late 19th century. Forest once covered all but the wettest areas of the district (historically known as ‘swamps’), but most of the district’s lowland and hill-country forest was cleared through wide-scale burning and milling and converted to pastoral farmland and settlements. Much of the lower Ōroua and Manawatū River catchment was a vast area of wetlands, but these were successively drained to make way for pastoral farming. Wetland destruction through drainage and incursion by exotic weed species continues today but at a lesser rate than historically, due to the very small area of wetlands remaining.

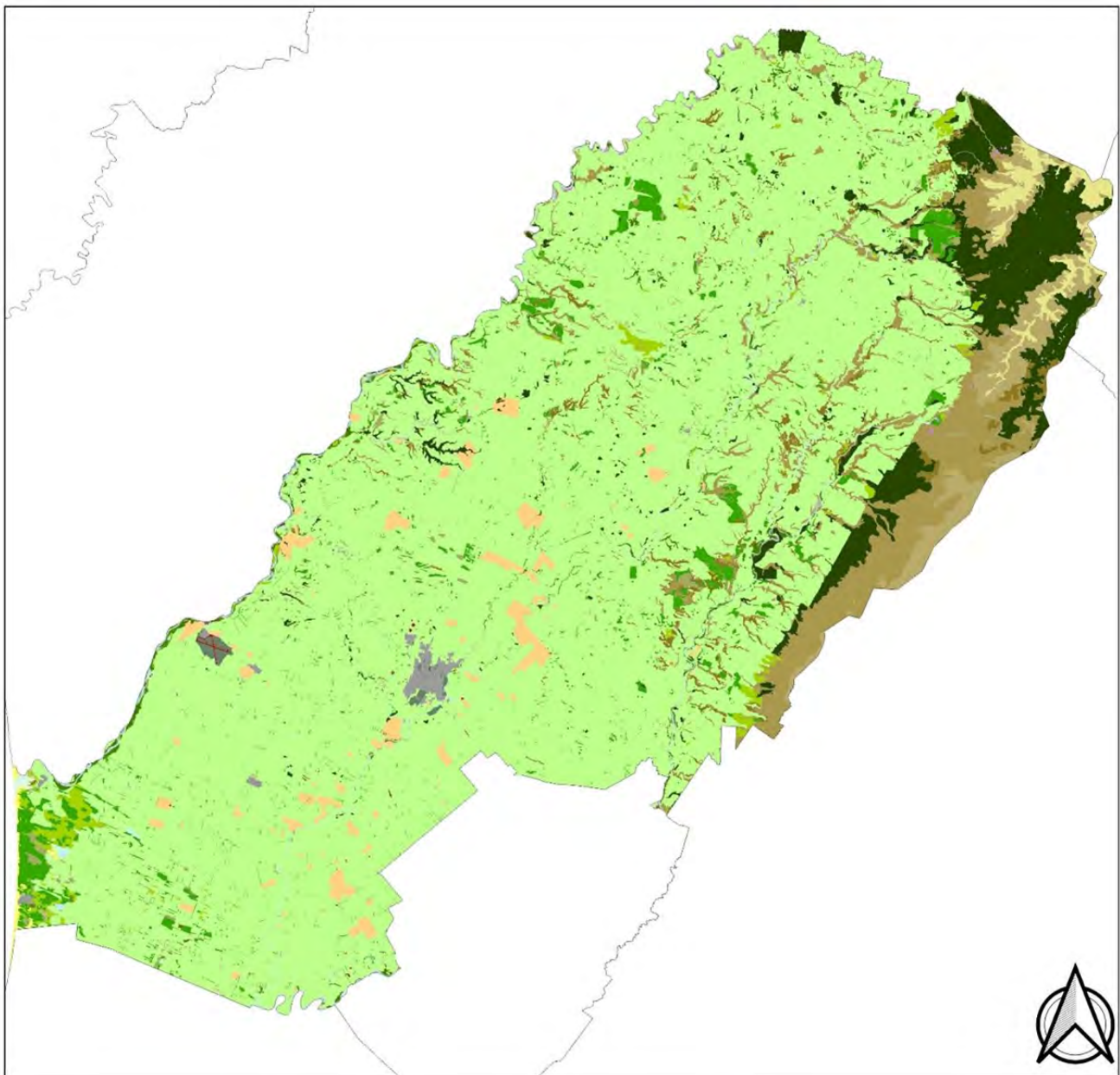
Today, as can be seen from Figure 2, most of our district’s land area is comprised of ‘high producing exotic grassland’ (light green), with small patches of ‘short rotation cropland’ (light apricot) and exotic plantation forest (forest green). In contrast, indigenous forest is confined to Tararua Range and its foothills and some gully systems to the north-west of the district. Wetlands, which once covered about 40 percent of our land area, now cover less than 0.5 percent of the District’s area (see Figure 3). The District is what ecologists refer to as an ‘ecological ground zero’ because there is so little of our original ecosystems remaining.

Indigenous forest in the higher altitude areas of the Ruahine Range and its foothills have survived, but these ecosystems are under pressure from pest species – primarily possums, stoats and rats. These species alter the composition of the forest, by eating large quantities of foliage and especially new growth (possums), and preying on indigenous animal species and their young. For instance, as a result of possum predation, the lower Ruahine Range, is now almost devoid of the stands of rata that used to dominate the canopy.<sup>4</sup>

4. Barnett, S. 2015. ‘Northern rata’, Wilderness Magazine, accessed from <https://www.wildernessmag.co.nz/seenorthern-rata/>



## Current land cover in the Manawatū District



|                                  |                                  |   |
|----------------------------------|----------------------------------|---|
| Broadleaved Indigenous Hardwoods | Herbaceous Freshwater Vegetation | Orchard, Vineyard or Other Perennial Crop |
| Built-up Area (settlement)       | Herbaceous Saline Vegetation     | River                                     |
| Deciduous Hardwoods              | High Producing Exotic Grassland  | Sand or Gravel                            |
| Estuarine Open Water             | Indigenous Forest                | Short-rotation Cropland                   |
| Exotic Forest                    | Lake or Pond                     | Sub Alpine Shrubland                      |
| Fernland                         | Landslide                        | Surface Mine or Dump                      |
| Flaxland                         | Low Producing Grassland          | Tall Tussock Grassland                    |
| Forest - Harvested               | Manuka and/or Kanuka             | Transport Infrastructure                  |
| Gorse and/or Broom               | Matagouri or Grey Scrub          | Urban Parkland/Open Space                 |
| Gravel or Rock                   | Mixed Exotic Shrubland           |   |

Figure 2: Land cover in the Manawatū District. Data from the Landcare Research Landcover database 2018/19.

## Extent of wetlands in the Manawatū – historic and current

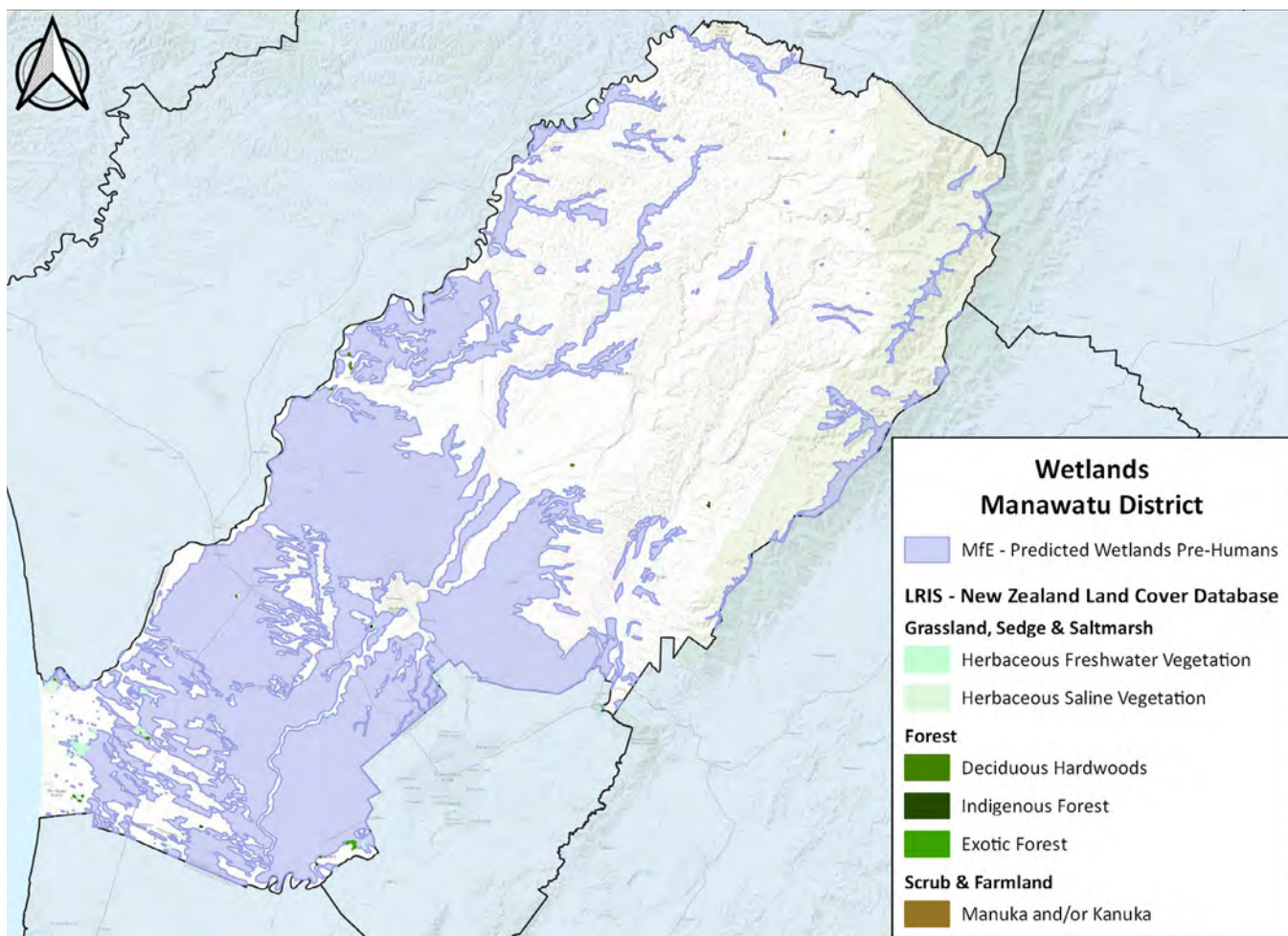


Figure 3: Historic extent created using data from the Ministry for the Environment. Current extent created using Landcare Research’s Land Cover Database v.5 (2020).

In the hill country, erosion remains a problem, particularly in the Pohangina Valley – though it is now less severe and widespread than it was 50 or more years ago as a result of improved land management practices, including tree-planting in the worst-affected areas. The Horizon’s Regional Council’s Sustainable Land Use Initiative has been particularly helpful in supporting farmers affected areas, allowing the regeneration of indigenous forest.<sup>5</sup>



Figure 4: Slips in the Manawatū following the 2004 storm. Source: NZ Farm Forestry Association and Manawatū District Council

5. For more information on the Sustainable Land Use Initiative see ‘Sustainable Land Use Initiative (SLUI)’, accessed from <https://www.horizons.govt.nz/managing-natural-resources/land>

## Freshwater

The District's rivers and streams have become degraded as a result of the cumulative effects of sedimentation (caused by historical deforestation and ongoing land uses that lead to hill country erosion or land disturbance), nutrient-laden runoff from farmland and wastewater and other discharges from urban areas. Additionally, the removal of most riparian forest exposes freshwater bodies to sunlight, streambank erosion and sedimentation, which makes them less suitable as habitat for indigenous fish and other species. The Ōroua River downstream of Feilding rates poorly for clarity, illness-causing E.coli, which indicates the presence of faecal matter in the river, phosphorus and ammoniacal nitrogen.<sup>6</sup>

However, there are signs of improvement in some indicators, particularly in levels of the nutrient phosphorus, which has decreased significantly since alum dosing has been used to remove phosphorus before discharging treated waste water into the river. (Recognising the decrease in dissolved reactive phosphorus, the river received an award as 'most improved river' in the Horizons Region in 2018. Nevertheless, it should be recognised that for mana whenua, Kauwhata, any level of wastewater or other pollutants being discharged into the stream is unacceptable.) Upstream, at Āpiti Gorge Bridge, water quality is significantly better than downstream, but is trending downwards for most indicators. The drivers of the decline is not clear, but could be climate-related (for instance, more frequent and serious heavy rain events leading to more sediment and nutrient-laden run-off flowing into the river and its tributaries).<sup>7</sup>

## Waste

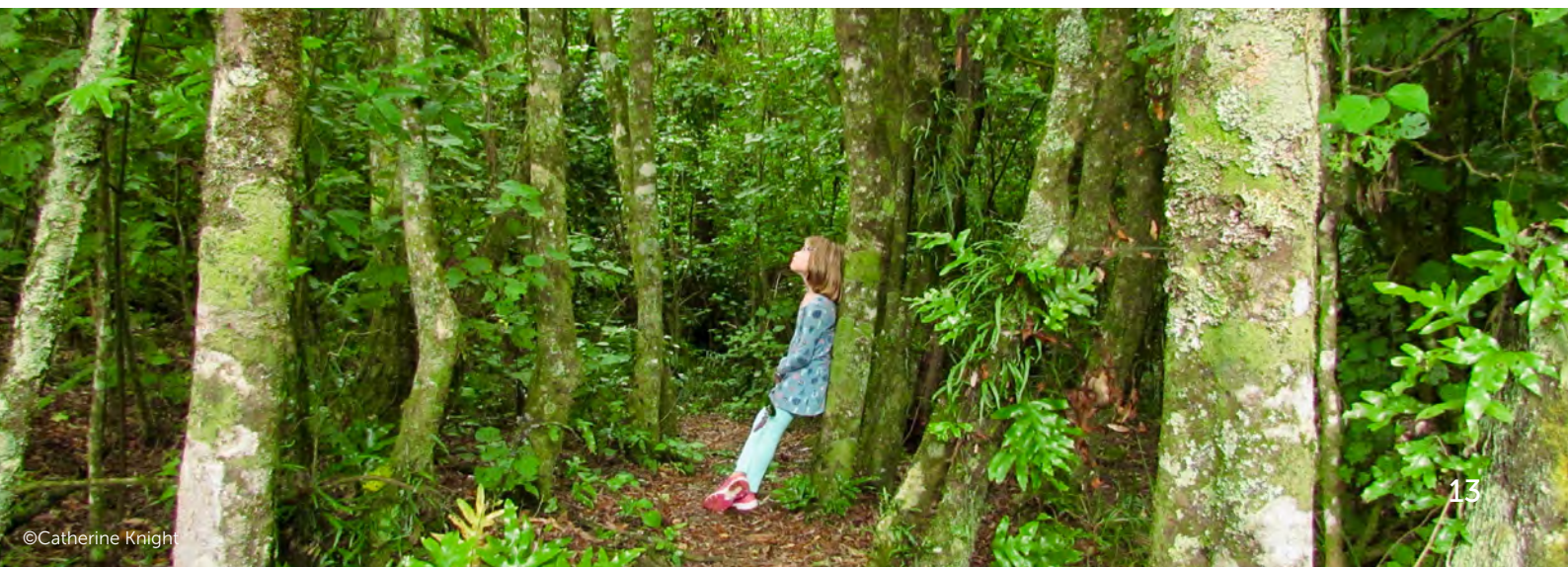
In terms of household waste, New Zealand is among the most wasteful countries in the world. According to a 2004 report by the OECD, New Zealanders generated 400 kg of household waste per person annually, making New Zealand ninth worst among OECD countries.<sup>8</sup> According to a subsequent report from the World Bank, since then our waste generated per capita has been trending upwards, with a 20 per cent increase reported just in the three years between 2015 and 2018.<sup>9</sup> In the Manawatū District, household, business and other organisations generate just over 10,400 tonnes of waste per year, about 3,300 kg of which is diverted from landfill (i.e., is recycled or is stockpiled for recycling). This amounts to approximately 320 kg of waste per capita. This volume reflects only the waste processed via Council through its transfer stations, and does not include waste sites on privately owned land.

6. As measured at the Boness Road site. This site rates in the worst 50% or 25% for these indicators. See <https://www.lawa.org.nz/explore-data/manawat%C5%AB-whanganui-region/river-quality/manawat%C5%AB/oroua-atus-feilding-stp/>

7. LAWA (Land and Water Aotearoa), n.d. 'Oroua at Apiti Gorge Bridge', accessed from <https://www.lawa.org.nz/explore-data/manawat%C5%AB-whanganui-region/river-quality/manawat%C5%AB/oroua-atapiti-gorge-bridge/>

8. Stats NZ, n.d., 'NZ in the OECD – environment', accessed from [http://archive.stats.govt.nz/browse\\_for\\_stats/government\\_finance/central\\_government/nz-in-theoecd/environment.aspx#gsc.tab=0](http://archive.stats.govt.nz/browse_for_stats/government_finance/central_government/nz-in-theoecd/environment.aspx#gsc.tab=0)

9. Newshub, January 2018. 'New Zealand among the most wasteful countries in the developed world – World Bank', accessed from <https://www.newshub.co.nz/home/new-zealand/2018/01/new-zealand-among-most-wastefulcountries-in-developed-world-world-bank.html> and 'Which country produces the most waste?', accessed from <http://www.eco2greetings.com/c/most-wasteful-countries/> (note that the data on this site is unverified but it provides a useful interactive map allowing the comparison of per capita generation of waste).



## 4. Climate change impacts on the Manawatū District

### Te pānga o te āhuarangi hurihuri ki te rohe o Manawatū

#### How is the District likely to be affected by climate change?

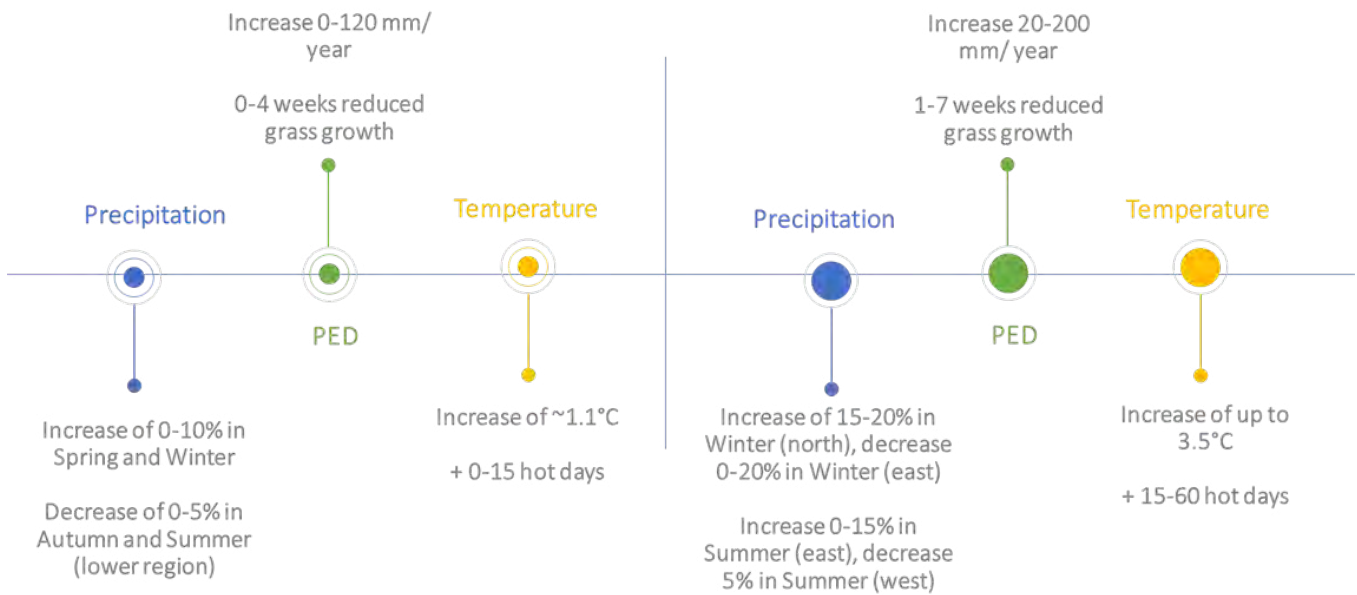
We are likely to see the consequences of climate change in our District, just as these consequences become evident across all of New Zealand. New Zealand has warmed by  $0.09 \pm 0.03^\circ\text{C}$  per decade since 1909, with more heat waves, fewer frosts, more rain in the south and west of New Zealand, less rain in the north and east of the North and South Islands, and a rise in sea level since 1900 of  $1.7 \pm 0.1$  mm/yr. Ongoing vulnerability in New Zealand to extreme events is demonstrated by substantial economic losses caused by droughts, floods, fire, tropical cyclones, and hail. During the 21st century, New Zealand's climate is highly likely to warm further, with noticeable changes in extreme events. Heat waves and fire risk are almost certain to increase in intensity and frequency. Floods, landslides, droughts, and storm surges are likely to become more frequent and intense, and snow and frost to become less frequent.

In the Manawatū-Whanganui region, a changing climate is likely to lead to changing weather patterns, including rising temperatures, an increase in the frequency and magnitude of rainfall, and associated flooding events (see Figure 5 below). An increase in rainfall events is also likely to lead to an increase in hill-country erosion, and as a result, more sediment in our rivers and streams (which in turn, increases flood risk). Coastal inundation is also likely to increase as a result of rising sea levels.

On the other hand, more prolonged and intense dry periods are also likely to increase. This is measured by the potential evapotranspiration deficit (PED). Evapotranspiration is the process by which water held in the soil is gradually released to the atmosphere through a combination of direct evaporation and transpiration from plants. As the growing season advances, the amount a water lost from the soil through evapotranspiration typically exceeds rainfall, giving rise to an increase in soil moisture deficit. PED represents the amount of water required to be replenished by rainfall or irrigation, to maintain plant growth at levels unconstrained by soil water shortage. Evapotranspiration is therefore measured in millimetres of water depth, like rainfall. New Zealand pasture in average silt-loam soils, for example, needs about 5–6 mm of water per day in summer, and about 1 mm in winter, to meet both its physiological requirements and the atmospheric demand.



## Climate projections for the Region (for years 2050, 2100)



|  | Climate change driver/variable                            | Mid term (2050) RCP8.5   | Long term (2100) RCP8.5  |
|--|---|--|--|
|  | <b>Higher temperature</b>                                 | + 0.5- 1.25°C<br>+ 1-1.25°C (Summer)   | + 2.5- 3.5°C<br>+ 3.0 – 3.5°C (Summer)   |
|  | <b>Average change in 'hot days' from present day (20)</b> | + 0-10 days (Central Plateau)<br>+ 15-20 days (Whanganui and hill country, Taumaranui) | + 5-20 days (Central Plateau)<br>+ 50-60 days (Whanganui and hill country, Taumaranui) |
|  | <b>Annual rainfall</b>                                    | - 8-15% in summer rainfall<br>+ 10-15% winter rainfall                                 |  |
|  | <b>Average change in 'cold nights' from present day</b>   | -0-10 cold nights (coastal)<br>-10-40 cold nights (inland, high elevation)             | - 0-10 cold nights (coastal)<br>-30-90 cold nights (inland, high elevation)            |
|  | <b>Sea level rise</b>                                     | + 0.3 m  | + 0.8 m  |
|  | <b>Inland flooding</b>                                    | + 7% rainfall depth<br>(24 hr, 100 yr)   |  |

Figure 5: Projections for the Horizons Region under RCP 8.5 (from the Horizons Regional Climate Change Risk Assessment, 2021). The RCP 8.5 trajectory represents the high-end emissions scenario (based on the models agreed by the IPCC), and is generally the recommended scenario when projecting physical climate change impacts

We know from a recent study commissioned by Horizons Regional Council<sup>10</sup> that the region is likely to experience warmer winters with fewer frosts, but hotter summers will bring increased risks of heat stress (experienced by sheep, cattle and farm other animals) and drought. Under the RCP 8.5 scenario (the highest emissions scenario), it is projected that the Manawatū District will have 10 to 15 more hot days (i.e., days reaching over 25 degrees C – the temperature at which farm stock start to experience heat stress) by 2040, and 30 to 50 more hot days by 2090.

With the warming of the climate, the introduction of new pests – or more favourable conditions for pests we already have – is likely to be an ongoing challenge, along with the possible introduction of subtropical diseases. Species that are already under threat or are at the limit of their climatic range may struggle to survive.

The increased level of flood risk and coastal inundation will affect both infrastructure and people. Of the nine districts included in the Horizons Region, the Manawatū District has the largest number of people in the projected flood hazard area (not taking into account the effects of climate change), followed by Palmerston North City.<sup>11</sup> Climate change is likely to have other implications for our communities too. Increased incidence of droughts will make it more important for rural communities to build resilience into their water supplies, for drinking water, general household and firefighting use.

As a district that relies heavily on the agricultural sector for its economic prosperity, the effects of climate change on agriculture are particularly critical. An extensive area of farmland in the district is already identified as being in the flood impact zone, but the area impacted by flooding is likely to increase as the effects of climate change progress.

In some areas, warmer temperatures will provide a more supportive environment for livestock, as higher temperatures increase the number of growth days for feed. Nevertheless, the increasing incidence of droughts, flooding, slips, and coastal inundation mean that farmers will face increased operating costs for advanced water and feed planning. Increased likelihood of heat stress in dairy cattle (as a result of the increased number of 'hot days') can result in reduced feed intake, which in turn results in lower milk production. In contrast, fewer frost days may lead to a higher incidence of frost-sensitive agricultural pests such as grass grub, and there is already some anecdotal evidence of this in the region. Farmers may have to consider adaptation strategies to compensate for these adverse changes, such as planting shelter belts for more shade, provision of additional water supply for stocking drinking water, and conversion to pasture species more resilient to certain pests etc.

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10. NIWA, June 2019, 'Climate change implications for the Manawatū Whanganui Region 2019' (report commissioned by Horizons Regional Council).

11. See NIWA, 2019, p.38.





## What climate change-related risks have been identified that will affect the District?

The recently completed National Climate Change Risk Assessment (Ministry for the Environment, 2020) identified risks at a national scale across five different 'domains': natural environment, human, economy, built environment and governance. Examples of identified risks that are likely to be of most relevance to the Manawatū District are outlined below (slightly rephrased in some cases).

### Natural environment

- Risks to indigenous ecosystems and species from the increased spread, survival and establishment of invasive species due to climate change (N2).

As noted above, this may mean that species that are already under threat or are at the limit of their climatic range may struggle to survive.

### Human

- Risks to physical health from exposure to storm events, heatwaves, vector-borne and zoonotic diseases, water availability and resource quality and accessibility, due to changes in temperature, rainfall and extreme weather events (H3).
- Risks of exacerbating existing inequities and creating new and additional inequities due to the uneven distribution of climate change impacts (H2).

### Economy

- Risks to council from economic costs associated with lost productivity, disaster relief expenditure and unfunded contingent liabilities due to extreme events and ongoing, gradual changes (E1).
- Risks to land-based primary sector productivity and output due to changes in mean rainfall and temperature, seasonality, weather extremes and changes in the distribution of invasive species (E3).
- Risks to the insurability of assets, due to ongoing sea-level rise and extreme weather events (E6).

### Built environment

- Risks to buildings due to extreme weather events, drought and increased fire weather (B2). (In the Manawatū, there is particular concern about drought increasing fire risk, particularly for our coastal communities in close proximity to pine forests.)
- Risks to landfills and contaminated sites due to extreme weather events (B3)
- Risk to wastewater and stormwater systems (and levels of service) due to extreme weather events and ongoing sea-level rise (B4).
- Risks to linear transport networks, due to changes in temperature and extreme weather events (B6).

## Governance

- Risk of maladaptation across all domains due to the application of practices, processes and tools that do not account for uncertainty and change over long timeframes (G1)
- Risks to governments and businesses from climate change-related litigation, due to inadequate or mistimed climate change adaptation (G3)

A Regional Climate Change Risk Assessment has also been completed for the Manawatū -Whanganui Region. It aims to highlight the highest risks and areas of priority for action for the Region, but the work to identify these risks and priorities is yet to be undertaken.

## Climate change impacts on the four wellbeings in the Manawatū District

### Environment

- Increased risk of pest animal, plant and disease incursions as a result of a warming climate
- Some indigenous species are already under threat or are at the limit of their climatic range may struggle to survive.

### Economy

- Potential of increased cost to local government as risk of damage to infrastructure increases
- Rising cost of insurance and increased incidence of uninsurability for some property and assets
- Increased risks associated with agriculture – crop and stock losses, land damage
- Some potential market growth opportunities as agricultural crops become unviable elsewhere (both nationally and internationally).

### Social

- Impacts of climate change may increase inequities as impacts fall unevenly across the community.

### Cultural

- Potential loss of cultural and historic sites due to flooding, erosion and rising sea levels
- Potential for increased sense of dislocation and loss in relation to ancestral land and waters (whenua and awa).

## 5. Manawatū District's contribution to greenhouse gases

### Tā te rohe o Manawatū tuku i ngā haurehu kati mahana

An inventory of the District's greenhouse gas emissions was undertaken in 2020, using data to 2019. This analysis categorises emissions in the following way: stationary energy (primarily the consumption of electricity and natural gas), transport, waste, industry, agriculture and forestry. Consistent with other rural districts, agriculture and transport make up the majority of emissions, at 70% and 25% respectively (see Figure 6). Within these sectors, on-road transport (petrol and diesel use) and enteric fermentation (fermentation that takes place in the digestive systems of animals, especially ruminant animals such as cattle) from farmed livestock are the largest emissions sources, at 23% and 56% respectively.

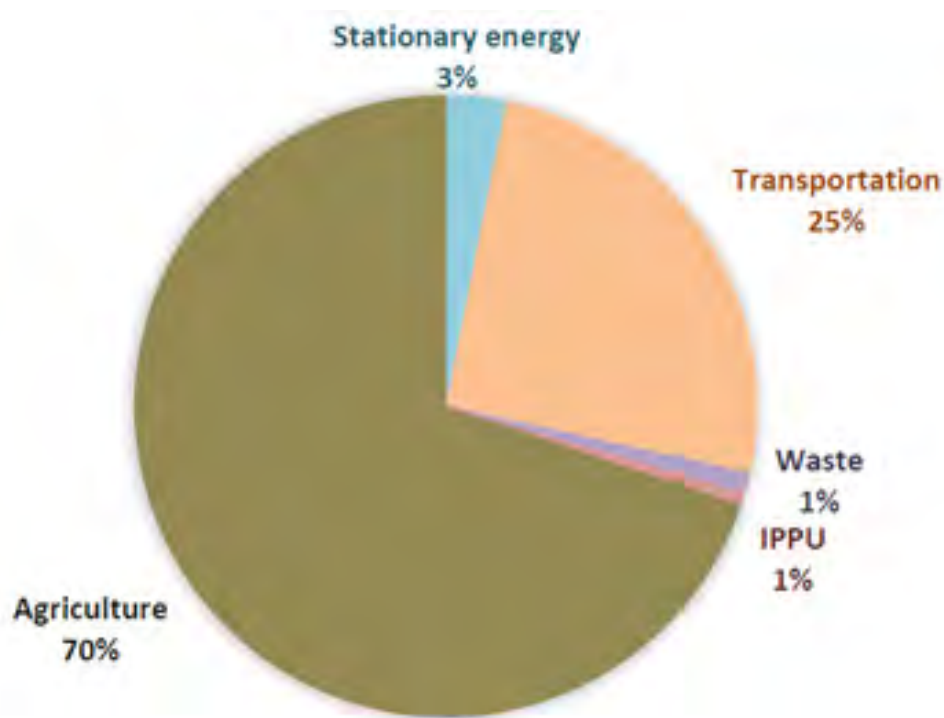


Figure 6: The breakdown of emissions sources in the Manawatū District



The Manawatū District contributed 17% of the Manawatū-Whanganui Region’s total gross emissions for the 2019 reporting year, making it the third highest contributing territorial authority in terms of gross emissions (following Tararua District at 21% and Rangitīkei at 18%). With a small population spread over a predominantly rural district, Manawatū had high per-capita gross emissions compared to Palmerston North (45.2 tonnes (t) of carbon dioxide (CO<sub>2</sub>) equivalent (e) compared to Palmerston North’s 10.2 tCO<sub>2</sub>(e)),<sup>12</sup> and Wellington, Auckland and New Plymouth (see Figure 7).

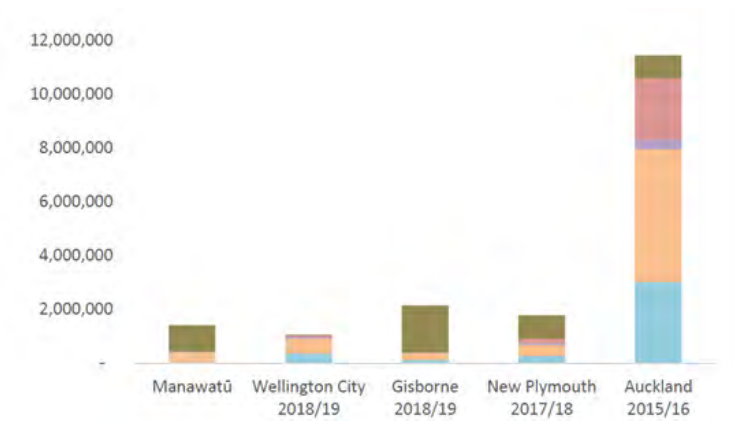


Figure 7: A comparison of GHG emissions with other districts in New Zealand by gross emissions (tCO<sub>2</sub>e) (Colour coding as per Figure 6).

The report concluded: ‘Results clearly highlight the need to reduce the impact of greenhouse gas emissions from on-road travel and the agriculture sector to limit the area’s contribution to global climate change’.<sup>13</sup>

12. Carbon dioxide equivalent is a standard unit for counting greenhouse gas (GHG) emissions regardless of whether they are from carbon dioxide or another gas, such as methane.

13. Manawatū Community Carbon Footprint 2019, August 2020, a report produced by Aecom, commissioned by Horizons Regional Council. The report also noted that ‘Data quality and availability varies widely between the sectors. Higher quality data for aviation, solid waste and on-road transport would be beneficial in improving accuracy of the results of future inventories’ (p.19).



## 6. What Council is already doing

### Ngā mahi a te Kaunihera i tēnei wā

Council has a number of initiatives underway that are intended to reduce its environmental impact. Some were driven originally by consent requirements (e.g., Wastewater Treatment Plant upgrade and Wastewater Centralisation Project) or capacity drivers (Resource Recovery Centre), which have provided the opportunity to identify ways in which reduced environmental impact can be designed into the projects, while others are driven by a corporate sense of responsibility (corporate waste and energy reduction initiatives).

#### Wastewater Treatment Plant upgrade

Council has upgraded the Wastewater Treatment Plant in Feilding to reduce the level of nutrients contained in the treated discharge flowing into the Ōroua River. The reduction of nutrients, primarily nitrogen, will lead to improvements in river water quality and health. The construction of an irrigation system allows Council to discharge treated effluent to land adjacent to the treatment plant during the summer months (over a duration of about 120 days). Not only does this mean less wastewater discharged to the river, the irrigated land produces grass that can be harvested as feed for cattle. Green waste and bio solids (the solid organic matter recovered from a sewage treatment process, often used as fertiliser) are composted and spread on land instead of going to landfill. As part of the upgrade, about 10,000 trees and shrubs have been planted around the treatment plant as buffer planting. Digesters have been installed to accelerate the treatment of organic matter, generating gas, which is in turn used to power boilers, reducing energy demand.

#### Wastewater Centralisation Project

The Wastewater Centralisation Project will remove treated effluent from over 100 km of waterways in the District by piping wastewater from the smaller wastewater treatment plants in the villages to the central treatment plant in Feilding. This wastewater will be treated and discharged to land during the summer months and into the Ōroua River during the remainder of the year.

#### Resource Recovery Centre

A new Resource Recovery Centre facility is being built, due for completion by the end of 2021. This will have increased capacity to allow for projected increases in waste and recycling. The new facility will provide the opportunity to increase waste diversion. By providing a better facility, Council anticipates being able to extract more material from potentially recyclable material and expand the range of recycling services offered to the public. The specific targets for the improvement of diversion rates will be formalised through the revised Waste Management and Minimisation Plan (due for completion in 2022).

#### Regional Climate Action Joint Committee

Councils in the Manawatū-Whanganui Region have committed to working together to identify risks, strategies and actions to mitigate and adapt to climate change. Along with the other councils in the region, Council is involved in the Regional Climate Action Joint Committee, both at a governance (committee) level and an officials (working group level). As part of this work, Horizons commissioned the Regional Climate Change Risk Assessment report, which is currently being finalised. Member councils committed to share our existing climate change response plans (or plans to produce these) by July 2021.

## Corporate waste and energy reduction initiatives

At a corporate level, Council is undertaking a number of initiatives to reduce the environmental impact of its operations. These include:

- Office waste minimisation efforts through the removal of larger rubbish bins and replacement with desktop mini bins to encourage staff to minimise waste to landfill and use recycling options, including for plastic, glass and organic waste.
- The purchase of a shredder to shred confidential documents, which staff can take home for use as mulch or compost. (Non-confidential documents go to regular recycling.)
- Regular waste audits to determine how much waste could be diverted to recycling. The sustainability team uses the results to make staff more aware of recycling, leading to reductions in some waste streams (at least in the short term).
- Changes to catering and food and beverage-related procurement to minimise waste, including the purchase of baking from local suppliers in reusable containers, and provision of glasses instead of disposable cups at water coolers.
- Purchase of an EV as latest addition to the Council vehicle fleet. While it will not be possible to replace many of the larger vehicles, such as utility vehicles, in the Council fleet with EV equivalents, managers are now encouraged to consider EVs or hybrids as part of a range of options when purchasing a new or replacement vehicle.



# 7. Summary

## Whakarāpopoto

Overall, this environmental stocktake report for the Manawatū District paints a picture of an environment under pressure. As a district, owing to the cumulative effects of human activity over a century or more, we have little of our indigenous habitats and biodiversity remaining and our rivers and streams are degraded. We are also facing increased likelihood of weather extremes (floods, storms and droughts) as the impacts of climate change become increasingly evident.

As the tier of government that most directly shapes local communities and their environment, local government also plays a critical role in improving the sustainability of our economy and improving environmental and human health outcomes for all of the community.

Our nation's efforts to achieve carbon neutrality by 2050 represent New Zealand's contribution to global efforts to avoid the most catastrophic extremes of climate change – recognising that climate change impacts are now not only inevitable, they are already taking effect. There are increasing expectations on local government sector to play its part, and show leadership, as the nation takes its first steps towards achieving carbon neutrality by 2050.

Council has taken some important steps to future-proof its major infrastructure – wastewater and town water supply, and to reduce the environmental impact of these services. A small but energetic team within Council has also implemented some valuable waste and energy reduction initiatives. However, there is no all-of-organisation strategy to reduce Council's environmental impact in a systematic or integrated way, whether it be through carbon emissions profile and mitigation or similar programmes. With the first national carbon emissions budgets due at the end of 2021, it is recommended that Council consider what it needs to do now to be better prepared for increased expectations and requirements that are likely to be associated with these budgets and related policy.





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